July 30, 1965

TO THE EDITOR:

I read your editorial on Mars, "The Dead Planet", with great interest and enthusiasm; but one remark in it is a prejudgment against what remains a perplexing and controversial scientific question, the independent evolution of any form of life beyond the earth. The Mariner photographs are very exciting but so far they have solidified previous expectations. They have not introduced new elements into the discussion that were not taken account of in previous deliberations.

The main point to stress is that we still do not know the abundance and distribution of water on Mars. However much there is, almost all of it must be frozen, and this makes it very difficult to decide between a vanishing layer of hoarfrost at the poles and a thick planetary crust of permafrost under a sunbaked surface. In either case, we have the likelihood of scattered oases with local conditions far more congenial to life than the average for the planet. After all, too obtuse a view of the earth would have us all submerged in a thousand fathoms of salt water. Already, the most exciting aspect of the Mariner pictures is indeed the great variety of surface detail that they do show, including bright patches on some craters suggesting frost.

There are many other questions that need far deeper study before any sweeping conclusions are justified. While I doubt that Mars has ever had extensive oceans, it is too early to assert this as settled fact. However, more likely almost all of its water has been frozen for most of its history.

The swing of general opinion about Mars has undoubtedly been overcolored by lurid fantasies of canal-building humanoids which have played no part in serious scientific analysis. Now that these have been happily relegated to their proper place in imaginative fiction, our study of the solar system can focus on rigorous factual questions which continue to have the deepest scientific and philosophical interest. Paramount among these is whether life in any form has evolved independently of the terrestrial system and man.

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